Dkt. 02058

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **BOX AF**

THIERRY ROMANET et al

Group Art Unit: 2856

Serial No.: 10/088,534

Examiner: C. Garber

Filed: June 28, 2002

For: METHOD AND APPARATUS USING HEAT FLUX TO DETECT OR MEASURE A DEPOSIT LIABLE TO FORM IN A FLUID-TRANSPORT PIPE

RESPONSE

Honorable Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

Applicants' attorney is appreciative of the interview granted by the Examiner on January 12, 2004. At that interview, the rejections of record were discussed, and the Examiner agreed that the final rejection should be withdrawn.

Claims 1, 3 through 9 and 11 have been rejected under 35 USC 102(b) over Hausler and Claims 2 and 10 have been rejected under 35 USC 103 over Hausler in further view of Ludington et al.

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The claimed invention is directed to a method and apparatus of detecting a deposit that might form on the inside of a fluid transport pipe by applying a thermal gradient to at least one active zone on the outside surface of the pipe, and measuring the heat flux of the outside surface of the pipe at a given distance from the active zone along the length of the pipe. Applicants have determined that if there is no deposit inside the pipe, the heat flux should be quite small, as shown by curve F1 in Figure 3 of the present application, where there is a deposit present inside the pipe, this deposit provides thermal insulation between the pipe and the transported fluid and the thermal gradient is not transmitted to the fluid but is transmitted substantially into the pipe structure itself. An example of the resultant thermal gradient is shown as curve F2 in Figure 3 of the present application.

The Hausler reference discloses an apparatus for measuring material buildup in a pipe utilizing an apparatus requiring removal and replacement of a section of the pipe. The apparatus includes a heating coil for the pipe, a thermocouple for measuring the temperature on the outside surface of the pipe, thermocouple for measuring the temperature of the inside surface of the pipe and a

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2thermocouple for measuring the temperature of the fluid flowing through the pipe. As argued at the interview, all heating and measuring of Hausler is done within a single heating zone, with the important temperature differential being the differential between the outer and inner surfaces of the pipe. Hausler does not measure the temperature of the pipe at a given longitudinal distance from the heating zone; instead, all temperature differential measurements are made radially within a single zone.

Applicants have further discovered that in utilizing this process, it is advantageous to vary the thermal gradient applied to the pipe, in order to separate the applied thermal gradient from any thermal variations which might be due to the environment outside the pipe or to the fluid which is being transported, as set forth in the paragraph bridging pages 7 and 8 of the specification. This embodiment is recited in Claim 2.

The Ludington et al reference discloses heating variations applied to samples in two or more containers in order to perform thermal assays on two different samples. The purpose of Ludington et al is not to measure deposits on the inner surface of a pipe, so Ludington et al does not suggest the reason why Applicants vary the applied thermal gradient,

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nor does Ludington et al cure the defects of the Hausler reference.

Withdrawal of these rejections is requested.

In view of the foregoing remarks, Applicants submit that the present application is now in condition for allowance. An early allowance of the application with amended claims is earnestly solicited.

Respectfully submitted,

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